WEST Search History

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L4: Entry 1 of 8 File: PGPB Jan 20, 2005

DOCUMENT-IDENTIFIER: US 20050015487 A1
TITLE: Method and system of remote diagnostic, control and information collection using a dynamic linked library of multiple formats and multiple protocols with intelligent protocol processor

Detail Description Paragraph:
[0097] The Format And Protocol Information Base System 570 (implemented as any one or a combination of package, DLL, static library, etc.) stores the format and protocol information and checks the combination of formats and protocols to determine the valid combinations. To facilitate the storage process, the storeFormatAndProtocol function accepts two parameters (i.e., one for format and one for protocol). The function checks to ensure that the parameters are a valid combination.

Detail Description Paragraph:
[0106] While the above discussion has generally focused on using a single protocol and/or a single data format, in an alternate embodiment, the present invention utilizes plural protocols and/or plural data formats. Those protocols and formats can include, but are not limited to any of the protocols and formats discussed herein. Exemplary formats include, but are not limited to, uncompressed or compressed versions of any one of: un-delimited text, SGML, XML, HTML, csv format, and binary. This enhances the number of possible ways that data can be transferred to support the monitoring of the present invention. Accordingly, one implementation of the application sends at least one (format, protocol) pair to be used by the computer code device (e.g., DLL). The computer code device checks that each pair is valid before storing it in the data structure of two maps. For example, if the format specifies the binary encoding of fixed format, but the protocol is SMTP with the plain text encoding in the mail body, the format and protocol are not a valid pair/combination. Before the monitored data are sent out, the computer code device checks if a selected protocol is restricted to support only one format. Two maps are used for this purpose. Then, the system utilizes the specified data format one at a time to generate the required format and sends out the generated data over all the protocol specified for this data format.

Detail Description Paragraph:
[0112] FIG. 21 describes the process by which the system manager 560 verifies whether a specified format and protocol combination is valid. A storeFormatAndProtocol request from the system manager 560 is initially handled by the CFormatProtocol_InformationBase interface 600. Using the relationships illustrated in FIG. 20, that interface 600 converts the request to an is FormatProtocolCombinationOK request that is sent on to the CFormatProtocolCombinationCheck class 610. If that class 610 returns "true," then the combination is valid; otherwise, the class 610 returns false indicating that the combination is invalid. When the combination is valid, the two values are stored into two different maps specified in the FIG. 23A.

Detail Description Paragraph:
[0115] FIGS. 24A and 24B show the class definition of CFormatProtocolCombinationCheck class 610. The main responsibility of the class 610

is to check whether a specified format and protocol combination is valid. The map, m_CombinationMartix, contains the information of the valid combination that is initialized by the function initMatrix.

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L4: Entry 2 of 8 File: PGPB Jan 16, 2003

DOCUMENT-IDENTIFIER: US 20030014515 A1
TITLE: Method and system of remote diagnostic, control and information collection using a shared resource

Detail Description Paragraph:
[0131] The format and protocol information base system 820 (implemented as any one or a combination of package, DLL, static library, etc) stores the data format and communication protocol information and checks the combination of formats and protocols to determine valid combinations, and sets the values to correct values or default values when the passed data are not correct. To facilitate the storage process, the storeFormatAndProtocol( ) function accepts two parameters (i.e., one for data format and one for communication protocol).

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L4: Entry 3 of 8 File: PGPB Oct 17, 2002

DOCUMENT-IDENTIFIER: US 20020152302 A1
TITLE: Method and system of remote diagnostic, control and information collection using multiple formats and multiple protocols with delegating protocol processor

Detail Description Paragraph:
[0132] The format and protocol information base system 820 (implemented as any one or a combination of package, DLL, static library, etc.) stores the data format and communication protocol information and checks the combination of formats and protocols to determine valid combinations, and sets the values to correct values or default values when the passed data are not correct. To facilitate the storage process, the storeFormatAndProtocol( ) function accepts two parameters (i.e., one for data format and one for communication protocol).

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L4: Entry 4 of 8 File: PGPB Oct 17, 2002

DOCUMENT-IDENTIFIER: US 20020152235 A1
TITLE: Object-oriented method and system of remote diagnostic, control and information collection using multiple formats and multiple protocols

Detail Description Paragraph:
[0132] The format and protocol information base system 820 (implemented as any one or a combination of package, DLL, static library, etc.) stores the data format and communication protocol information and checks the combination of formats and protocols to determine valid combinations, and sets the values to correct values or default values when the passed data are not correct. To facilitate the storage process, the storeFormatAndProtocol( ) function accepts two parameters (i.e., one for data format and one for communication protocol).

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L4: Entry 5 of 8 File: PGPB Oct 17, 2002

DOCUMENT-IDENTIFIER: US 20020152028 A1
TITLE: Method and system of remote position reporting device

Detail Description Paragraph:
[0049] The Format And Protocol Information Base System 606 (implemented as any one or a combination of package, DLL, static library, etc.) stores the format and protocol information and checks the combination of formats and protocols to determine the valid combinations. To facilitate the storage process, the storeFormatAndProtocol function accepts two parameters (i.e., one for format and one for protocol). The function checks to ensure that the parameters are a valid combination.

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L4: Entry 6 of 8 File: PGPB Oct 10, 2002

DOCUMENT-IDENTIFIER: US 20020147858 A1
TITLE: Method and system of remote diagnostic, control and information collection using multiple formats and multiple protocols with verification of formats and protocols

Detail Description Paragraph:
[0129] The format and protocol information base system 820 (implemented as any one or a combination of package, DLL, static library, etc.) stores the data format and communication protocol information and checks the combination of formats and protocols to determine valid combinations, and sets the values to correct values or default values when the passed data are not correct. To facilitate the storage process, the storeFormatAndProtocol( ) function accepts two parameters (i.e., one for data format and one for communication protocol).

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L4: Entry 7 of 8 File: USPT Feb 15, 2005

DOCUMENT-IDENTIFIER: US 6857016 B1
TITLE: Method and system of data collection and mapping from a remote position reporting device

Detailed Description Text (23):
The format and protocol information base system 606 (implemented as any one or a combination of package, DLL, static library, etc.) stores the format and protocol information and checks the combination of formats and protocols to determine the valid combinations. To facilitate the storage process, the storeFormatAndProtocol ( ) function accepts two parameters (i.e., one for format and one for protocol). The function checks to ensure that the parameters are a valid combination.

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L4: Entry 8 of 8 File: USPT Jul 16, 2002

DOCUMENT-IDENTIFIER: US 6421608 B1
TITLE: Method and system of remote position reporting device

Detailed Description Text (24):
The Format And Protocol Information Base System 606 (implemented as any one or a combination of package, DLL, static library, etc.) stores the format and protocol information and checks the combination of formats and protocols to determine the valid combinations. To facilitate the storage process, the storeFormatAndProtocol function accepts two parameters (i.e., one for format and one for protocol). The function checks to ensure that the parameters are a valid combination.

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L8: Entry 1 of 1 File: DWPI Nov 28, 2000

DERWENT-ACC-NO: 2001-201643
DERWENT-WEEK: 200120

TITLE: Wall embedded data translator for data network installed in buildings providing interface for network-attached system, has transceivers to transmit and receive data in specific format and respective protocols

Basic Abstract Text (1):
NOVELTY - Two data transceivers (132,136) in the translator are adapted to receive and transmit data in fiber optic format with corresponding data protocol and in twisted pair format with corresponding protocol respectively. The transceivers are mounted in fixed relation on a utility panel and provide bidirectional data path. A power supply is connected to supply power to both the transceivers.

PF Application Date (1):
19980702

L12: Entry 1 of 4 File: USPT Oct 8, 2002

DOCUMENT-IDENTIFIER: US 6462673 B1
TITLE: Asymmetric-rate communication method and system for remote data collection

Abstract Text (1):
An asymmetric-rate communication method and system for remote data collection using a processor-operated modem at a respective data collection site is provided. The modem processor used at the data collection site may be rated to have a predetermined relatively low processing power. The method includes a first selecting step that allow for selecting a first protocol for transmitting data at a predetermined rate. The selected first protocol uses a predetermined percentage of the processing power of the processor. The method includes a second selecting step that allows for selecting a second protocol for receiving data at another predetermined rate. The selected second protocol uses another predetermined percentage of the processing power of the processor. A third selecting step allows for selecting the percentage of processing power used for receiving data to be sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements are kept within the low processing power of the processor.

Application Filing Date (1):
19991221

Brief Summary Text (2):
The present invention is generally related to data communication, and, more particularly, to an asymmetric-rate communication method and system for remote data collection using a processor-operated modem at a respective data collection site.

Brief Summary Text (3):
In various remote data collection situations, such as meter data reading or collecting diagnostic data of a respective machine or appliance, over phone lines using a modem, it is usually required to receive much more data from the data collection site, such as may be collected from a respective meter or respective machine, than it is transmitted to the machine or the meter. A common problem encountered with presently commercially available modems is that such modems expend almost twice the computational power of their respective digital signal processor (DSP), as may be generally indicated by the number of million of instructions per second (MIPS) that the processor is rated to execute, in receiving data than they do in transmitting the collected data. Thus, it would be desired to correct this waste of DSP processing power by receiving data at a relatively slow rate compared to the rates for transmitting the data. Although there are modem protocols or standards that support asymmetrical transmission (e.g. the ITU v.34 telecommunication standard), presently existing protocols are believed to only allow for asymmetry in the transmit/receive rates within a given protocol and, unfortunately, they do not allow for mixing distinct protocols, such as would be needed for efficient utilization of the DSP processing power. The above result is not surprising since such known protocols that may support asymmetric rates are not designed for optimizing DSP processing power and, consequently, there is little benefit, at least from the MIPS utilization standpoint, to use the presently existing asymmetric protocols to conserve processing power of the DSP. Thus, it is

desirable to provide an asymmetric-rate communication method and system that is able to be adapted to make efficient use of DSP processing power based on the characteristics of the remote data collection, such as may be encountered in collecting meter data, e.g., data measuring electric power consumption or water consumption, etc., or in collecting diagnostic data from machines that may be remotely located relative to one another and to a remote service center where the meter data and/or diagnostic data may be further processed.

Brief Summary Text (5):
Generally speaking the present invention fulfills the foregoing needs by providing an asymmetric-rate communication method for remote data collection using a processor-operated modem at a respective data collection site. The modem processor used at the data collection site may be rated to have a predetermined relatively low processing power. The method includes the following steps: selecting a first protocol for transmitting data at a predetermined rate, the selected first protocol using a predetermined percentage of the processing power of the processor; selecting a second protocol for receiving data at another predetermined rate, the selected second protocol using another predetermined percentage of the processing power of the processor; and selecting the percentage of processing power used for receiving data to be sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements are kept within the rated processing power of the processor.

Brief Summary Text (6):
The present invention further fulfills the foregoing needs by providing a modem communication system configured to provide asymmetric-rate communication for remote data collection. The system includes a modem at each of a respective plurality of data collection sites. Each modem at each of the respective data collection sites using a respective processor rated to have a predetermined processing power. The system further includes a modem at a remote service center using a respective processor rated to have another predetermined processing power. The remote service center modem may be coupled to communicate with each modem at the respective plurality of data collection sites. The processing power of the processor modem at the data collection site may have a relatively low processing power relative to the processing power of the processor modem at the service center. The respective modem processor for each data collection site in turn includes a first processor module configured to use a first protocol for transmitting data at a predetermined rate. The first processor module uses a predetermined percentage of the processing power of the processor modem at the data collection site. The modem processor at the data collection site further includes a second processor module configured to use a second protocol for receiving data at another predetermined rate. The second processor module uses another predetermined percentage of the processing power of the processor modem at the data collection site wherein the percentage of processing power used for receiving data is chosen to be sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements of the modem processor at the data collection site may be kept within its relatively low processing power.

Detailed Description Text (2):
FIG. 1 illustrates an exemplary flow chart for the method of the present invention. As suggested above, this invention uses distinct transmission and reception protocols to better utilize the DSP modem processing power (e.g., MIPS) required for data communication, e.g., meter data, diagnostic data, etc. As shown in FIG. 1, subsequently to start of operations at step 10, step 12 allows for selecting a first protocol for transmitting data at a predetermined rate. The selected first protocol uses a predetermined percentage of the processing power of the modem processor at a data collection site. Step 14 allows for selecting a second protocol for receiving data at another predetermined rate. The selected second protocol uses

another predetermined percentage of the processing power of the processor. Prior to return step 18, step 16 allows for selecting the percentage of processing power used for receiving data to be sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements are kept within the rated processing power of the modem DSP.

Detailed Description Text (3):
Below is described an example first illustrating results using presently known techniques, which results will then be compared with the results now achievable with the method of the present invention. Assuming a moderately-fast protocol, such as a V32 bis protocol (rated to provide maximum data rate transfers of 14.4 kilobytes per second (KBPS)), is used both for transmit and receive, then approximately 24 MIPS would be consumed by the DSP that operates the modem. Such processing power requirements for the data transmission/reception could be implemented using a commercially available DSP chip, such as a TMS 320C203 DSP and the like. It can be shown that out of the total of 24 MIPS, then about 8 MIPS of processing power would be used for transmitting data and about 16 MIPS of processing power would be used for receiving data. On the other hand, assuming by way of example and not of limitation that a second protocol having a relatively low data rate transfer, such as a V22 protocol (rated to provide a maximum rate of 1200 BPS) or having even a lower data rate transfer, such as a Bell standard (rated to provide a maximum rate of 300 BPS), were to be used for receiving the data in lieu of the V32 bis protocol, then the MIPS, that is the DSP processing power required for receiving the data can be shown to drop to about 4 MIPS from the processing power (in this example 16 MIPS) originally required for receiving data from the service center. Under this set of assumptions, then the total MIPS required using the asymmetric-rate communication method of the present invention will result in savings of approximately 12 MIPS or about half of the original processing power of the DSP. It will be appreciated by those skilled in the art that even faster communication protocols, such as V.34, V.90, or even higher speed protocols may be chosen for the transmission rate with even higher savings in MIPS processing power. Thus, it will be appreciated that the method of the present invention allows for using at the data collection site DSP modems rated to have a lower computational or processing power than would be the case under existing techniques and this allows for using lower cost DSPs to be used or, alternatively, allows for providing additional functions at the same cost in the event the designer chooses not to use a DSP rated to have a relatively lower processing power.

Detailed Description Text (4):
FIG. 2 shows a block diagram schematic of an exemplary modem communication system embodying the present invention. As discussed above in the context of FIG. 1, the communication system is configured to provide asymmetric-rate communication for remote data collection. As shown in FIG. 2, the system includes a plurality of modems 20.sub.1, 20.sub.2 . . . . 20.sub.n at each of a respective plurality of data collection sites. Each modem 20 at each of the respective data collection sites uses a respective processor 22 rated to have a predetermined processing power. A modem 24 at a remote service center that receives data from each of the modems 20 uses a respective processor 26 rated to have another predetermined processing power. The remote service center modem 24 is coupled to communicate with each modem 20 at the respective plurality of data collection sites via telephone lines 28. As suggested above, the processing power of each processor modem 22 at the data collection site may be chosen to have a relatively low processing power relative to the processing power of the processor modem 26 at the service center.

Detailed Description Text (5):
By way of example, each respective modem processor 22 for each data collection site may include a respective first processor module 30 configured to use a first protocol for transmitting data at a predetermined rate. The first processor module 30 uses a predetermined percentage of the processing power of the processor modem

22 at the data collection site. A second processor module 32 is configured to use a second protocol for receiving data at another predetermined rate. The second processor module 32 uses another predetermined percentage of the processing power of the processor modem at the data collection site wherein the percentage of processing power used for receiving data is chosen to be sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements of each modem processor 22 at the data collection site is kept within its relatively low processing power. It will be appreciated that the modem communication system of FIG. 2 allows for bi-directional communication between the modem 24 at the service center and each of the respective modems 20 at each of the data collection sites. It will be further appreciated that the foregoing processor modules need not be hardware modules since the operational and functional interrelationships respectively enabled by such modules can be implemented in respective software modules using well-known programming techniques to one of ordinary skill in the art. Preferably, the amount of data transferred from the service center modem 24 to any one of the data collection modems 20 should be sufficiently low relative to the amount of data transferred to the service center modem from any one of the data collection modems. Similarly, the frequency of data transfers from the service center modem to any one of the data collection modems should be sufficiently low relative to the frequency of data transfers into the service center modem from any one of the data collection modems. For example, while the transmission of data from the data collection site may occur on monthly, weekly or even daily basis, it is contemplated that the transmission of data from the service center to the data collection sites may occur much less frequently, such as may be necessary when new updates or software versions are uploaded into a meter or a machine on much infrequent basis relatively to the downloads from the respective data collection sites. Similarly, it is contemplated that the amount of data transferred from the service center to any one of the data collection modems may generally comprise short and straight-forward signal commands or instructions, as opposed to the relatively large amount of data to be collected from each of the modems at the respective data collection sites.

Detailed Description Text (6):
As further illustrated in FIG. 2, the respective modem processor 26 for the service center may include a first processor module 34 configured to use the first protocol for receiving data at the predetermined rate from any one of the modems 20 at the respective data collection sites. The processor module 26 further includes a second processor module 36 configured to use the second protocol for transmitting data at another predetermined rate to each of the modems 22 at the respective data collection sites.

Detailed Description Text (7):
It will be appreciated that the system of the present invention may be particularly cost effective since the number of data collection sites may be significantly larger than the number of service centers and hence the magnitude of the savings that can now be obtained with the present invention can be huge due to the multiplier effect caused by the large number of data collection sites. For example, the number of data collection sites could be in the millions while the number of service centers could be at most a few dozen and therefore even saving a few dollars per DSP at each data collection site can result in multi-million dollar savings.

CLAIMS:

1. An asymmetric-rate communication method for remote data collection using a processor-operated modem at a respective data collection site, the modem processor used at the data collection site rated to have a predetermined relatively low processing power, the method comprising: using a first protocol for transmitting data at a predetermined rate, the first protocol using a predetermined percentage of the processing power of the processor; using a second protocol for receiving

data at another predetermined rate, the second protocol using another predetermined percentage of the processing power of the processor; wherein the percentage of processing power used for receiving data is sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements are kept within the rate processing power of the processor.

2. The method of claim 1 wherein the data collection comprises collecting data from a respective data-source device at the data collection site.

5. The method of claim 4 further comprising a step of transmitting from the service center modem predetermined data to the modem at the data collection site.

6. The method of claim 5 wherein the amount of data transmitted from the service center modem to the data collection modem is sufficiently low relative to the amount of data transmitted to the service center modem from that data collection modem.

7. The method of claim 5 wherein the frequency of data transfers from the service center modem to the data collection modem is sufficiently low relative to the frequency of data transfers into the service center modem from that data collection modem.

8. The method of claim 4 wherein the service center modem is configured to transmit data to the date collection modem using the second protocol and is further configured to receive data from the data collection modem using the first protocol.

9. A processor configured to provide asymmetric-rate communication for remote data collection in a processor-operated modem at a respective data collection site, the processor used at the data collection site rated to have a predetermined relatively low processing power, the processor comprising: a first processor module configured to use a first protocol for transmitting data at a predetermined rate, the first processor module using a predetermined percentage of the processing power of the processor; and a second processor module configured to use a second protocol for receiving data at another predetermined rate, the second processor module using another predetermined percentage of the processing power of the processor wherein the percentage of processing power used for receiving data is chosen to be sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements are kept within the rated processing power of the processor.

12. The processor of claim 10 further comprising means for transmitting the acquired data from the data collection site to a remote service center modem.

14. The processor of claim 13 wherein the amount of data transferred from the service center modem to the data collection modem is sufficiently low relative to the amount of data transmitted to the service center modem from that data collection modem.

15. The processor of claim 14 wherein the frequency of data transfers from the service center modem to the data collection modem is sufficiently low relative to the frequency of data transfers into the service center modem from that data collection modem.

16. A modem communication system configured to provide asymmetric-rate communication for remote data collection, the system comprising: a modem at each of a respective plurality of data collection sites, each modem at each of the respective data collection sites using a respective processor rated to have a predetermined processing power; a modem at a remote service center using a

respective processor rated to have another predetermined processing power, the remote service center modem coupled to communicate with each modem at the respective plurality of data collection sites, the processing power of the processor modem at the data collection site having a relatively low processing power relative to the processing power of the processor modem at the service center, the respective modem processor for each data collection site comprising: a first processor module configured to use a first protocol for transmitting data at a predetermined rate, the first processor module using a predetermined percentage of the processing power of the processor modem at the data collection site; and a second processor module configured to use a second protocol for receiving data at another predetermined rate, the second processor module using another predetermined percentage of the processing power of the processor modem at the data collection site wherein the percentage of processing power used for receiving data is chosen to be sufficiently low relative to the percentage of processing power used for transmitting data so that the combined transmitting and receiving processing requirements of the modem processor at the data collection site are kept within its relatively low processing power.

17. The system of claim 16 wherein each modem at the data collection site has means for collecting data from a respective data-source device.

19. The system of claim 17 wherein each modem at the data collection site has means for transmitting the data from the data collection site to the remote service center modem.

20. The system of claim 19 wherein each modem at the data collection site has means for receiving data from the service center modem.

21. The system of claim 20 wherein the amount of data transferred from the service center modem to any one of the data collection modems is sufficiently low relative to the amount of data transferred to the service center modem from that one data collection modems.

22. The system of claim 20 wherein the frequency of data transfers from the service center modem to any one the data collection modems is sufficiently low relative to the frequency of data transfers into the service center modem from that one of the data collection.

23. The system of claim 20 wherein the respective modem processor for the service center comprises: a first processor module configured to use the first protocol for receiving data at the predetermined rate from any one of the modems at the respective data collection sites; and a second processor module configured to use the second protocol for transmitting data at the another predetermined rate to each of the modems at the respective data collection sites.

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L12: Entry 2 of 4 File: USPT Jan 23, 2001

DOCUMENT-IDENTIFIER: US 6178207 B1
TITLE: Aircraft combat training signal processing system

Application Filing Date (1):
19980109

Brief Summary Text (5):
Military training of aircraft combat crews involves maneuvering aircraft across specified terrain and airspace in simulated battle operations. Instrumentation mounted in the aircraft provides position information and performance data to ground-based stations, which collect the aircraft data, process it, and generate reports on likely combat effectiveness of the crews and equipment. A wide variety of aircraft operations can be simulated, including air combat and ground attack. The data processing can determine the likely effect of weapons delivery, keep track of objects being fired upon, and assess likely damage to targets and to attacking aircraft.

Detailed Description Text (17):
The next step, represented by the flow diagram box numbered 304, is for the microprocessor to determine if the receiving mode is desired and to select between the first protocol, the TACTS mode, and the second protocol, the HDR mode. Next, the microprocessor sets the microprocessor interface register values appropriate for the selected mode, either TACTS or HDR. This operating step is represented by the flow diagram box numbered 306. Finally, the microprocessor processes the next message, either a receive message or a transmit message, as indicated by the flow diagram box numbered 308.

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L12: Entry 3 of 4 File: USPT Apr 20, 1999

DOCUMENT-IDENTIFIER: US 5896561 A
TITLE: Communication network having a dormant polling protocol

Application Filing Date (1):
19961223

Detailed Description Text (187):
FIGS. 13 to 16 illustrate enhanced protocol systems suitable for upgrading a system such as illustrated in FIG. 5 for increased data throughput without requiring the upgrading of firmware in the large population of terminals designed for single data rate operation at the normal data rate. The approach of FIGS. 13 to 16 achieves an advantageous simplicity in operation of the data collection system in spite of the presence of such single data rate mobile terminal units.

Detailed Description Text (196):
In the generalized case, the unit completing the handshake transmission (e.g. the unit making the response to a multi-terminal contention poll) makes the rate switching decision. In the embodiment of FIGS. 13 and 14, the rate switching decision is to be made by the mobile terminal unit. A decision in both the base station and the mobile transceiver unit might be desirable if the channel were not symmetric, for example if the base station had significantly higher power output than the mobile unit. The approach of having the mobile transceiver units equipped with sufficient intelligence to distribute to them the data rate switching rate decision, results in fewer transmissions required to dynamically adapt data rate in a rapidly changing propagation environment. The system as represented in FIGS. 13 and 14 in this respect is particularly adapted to the data collection environment wherein the mobile transceiver units may be in continuous or frequent motion with consequent rapid variations in signal strength, frequent operation in fringe conditions, and environmental extremes (e.g. of temperature as between a mobile unit and base station) degrading hardware performance.

CLAIMS:

9. In a radio frequency data communication network located within a premises and having a base station and a plurality of roaming transceivers that are battery powered, a method comprising:

dynamically selecting, by the base station, either a first protocol that requires periodic transmissions by the base station to managing communication among the plurality of roaming transceivers, or a second protocol that does not require periodic transmissions by the base station to permit management of communication by the plurality of roaming transceivers; and

dynamically selecting, by the plurality of roaming transceivers, the second protocol after failing to identify periodic transmissions by the base station.

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L12: Entry 4 of 4 File: USPT Jun 29, 1993

DOCUMENT-IDENTIFIER: US 5224157 A
TITLE: Management system for managing maintenance information of image forming apparatus

Application Filing Date (1):
19900522

Detailed Description Text (45):
(a) First protocol mode : After setting the copy data controllers 20 connectable to the on-line controller 30 in the communication mode, the on-line controller 30 is connected to the center control unit 50 through the telephone line. At that time, the center control unit 50 sequentially collects the copy data one by one from all the copy data controllers 20 connectable to the on-line controller 30.

Detailed Description Text (49):
As shown in FIG. 6a, there are provided ten monitor LEDs 207 or L1 to L10 on the left side of the operation panel. On the other hand, there are provided two monitor LEDs L11 and L12, and three switches ADJ, SEL and 208 on the right side thereof. The monitor LEDs L1 to L10 display the line connection state with the center control unit 50, and also display the selected item and the selected digit in the setting mode. Further, the monitor LEDs L11 and L12 display a mode state in the setting mode, and also displays an error state upon a self-test of the microcomputer 31. The setting switch ADJ sets the item and the numeral value which are selected by the selection switch SEL, and also is used as a switch for starting the self-test. The selection switch SEL is used for selecting one value among "0" to "9", and also selecting one of six kinds of self-tests "A" to "F". The switch 208 is used for selecting either one of the first protocol mode and the second protocol mode.

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L16: Entry 1 of 1 File: PGPB Apr 21, 2005

DOCUMENT-IDENTIFIER: US 20050083836 A1
TITLE: Flow control for interfaces providing retransmission

Detail Description Paragraph:
[0028] Following transmission of the start bit, successive data bits D0, D1, etc., may be placed on the I/O connection after each rising edge of the CLK signal. The transmitted bits may be followed by integrity-check data, for example, by a single parity bit "PY." A DSR_RDY bit (214 in FIG. 2) may be set true when a complete sequence of bits has been received by the deserializer (210 in FIG. 2), and may be cleared when the output byte is accepted by the receive buffer (214 in FIG. 2). After transmitting the parity bit PY, the client may release the I/O connection, returning it to a high impedance "z" state so that the host can drive the I/O connection in order to indicate a transmission failure. In the absence of an indication of an error condition from the host, the client may begin transmission of the subsequent data sequence some time thereafter.

CLAIMS:

1. A method of effecting a substitute for a data communication target protocol in communications between a host interface device and a client interface device, the method comprising: a) selecting a first protocol that is supported by the client, such that a first predetermined data and control signal sequence conveyed to the client from the host predictably elicits a response from the client that accords with the supported protocol, wherein the predetermined data and control signal sequence is initiated by the host to invoke the supported protocol; b) selecting a different second protocol that is unsupported by the client in that the host does not have access to a unique data and control sequence that will predictably elicit a response, required by such unsupported protocol, when conveyed from the host to the client; c) determining a need for invocation of the second protocol to effect a particular function in the host that is not explicitly effected by the supported protocol; d) conveying the first predetermined data and control signal sequence from the host to the client; e) receiving a response to the host from the client that accords with the supported protocol; and f) interpreting the response, within the host, to approximately effect the particular function in the host.

L22: Entry 1 of 8 File: USPT Sep 4, 2001

DOCUMENT-IDENTIFIER: US 6285659 B1
TITLE: Automatic protocol selection mechanism

Abstract Text (1):
A network device automatically detects the best protocol a network will support. The network device includes a driver for transmitting data, a receiver for receiving data, and a port operationally coupled to the driver and receiver. The network device further includes negotiation logic coupled to the driver and receiver for selecting a protocol in coordination with other network devices. The network device further includes error detection logic and backs down to a lower transmission rate if errors are detected after the initial negotiation of the selected protocol.

Application Filing Date (1):
19970910

Brief Summary Text (18):
The primary standard for Local and Metropolitan Area Network technologies is governed by IEEE Std. 802, which is incorporated by reference herein. IEEE Std. 802 describes the relationship among the family of 802 standards and their relationship to the ISO OSI Basic Reference Model. Generally, IEEE Std. 802 prescribes the functional, electrical and mechanical protocols, and the physical and data link layers for Local and Metropolitan Area Networks (LAN/MAN). The specification augments network principles, conforming to the ISO seven-layer model for OSI, commonly referred to as "Ethernet". In the hierarchy of the seven-layer model, the lowest layers, the so-called physical and data link layers, comprise functional modules that specify the physical transmission media and the way network nodes interface to it, the mechanics of transmitting information over the media in an error-free manner, and the format the information must take in order to be transmitted.

Brief Summary Text (31):
The present invention solves the above-described problems by providing a driver for transmitting data, a receiver for receiving data, a port coupled to the driver and to the receiver for communicating on a network, negotiation logic coupled to the driver and receiver for selecting a first protocol, error detection logic coupled to the port for detecting an error count, and a protocol controller coupled to the negotiation logic and to the error detection logic wherein the error count triggers the protocol controller to cause a second protocol.

Detailed Description Text (9):
As with the 100Base network computers, the 10Base network computers also communicate with the repeater hub 40 constructed in accordance with the present invention, the network computer 26 automatically detects errors in the transmitted or received data packets. The network computer 26 monitors these detected errors. When the total number of errors or the error rate or other measure of erroneous transmission or reception exceeds a threshold level, the network computer disconnects the link. The network computer 26 and the repeater hub 40 then renegotiate the link protocol. As a result of the detected errors, the network

computer does not advertise its 100Base capability so that the link will be established using 10Base or other more reliable protocol. Likewise, the repeater hub 40 may automatically detect errors in transmitted or received data packets, to renegotiate a more reliable protocol.

Detailed Description Text (12):
Generally, the preamble is a sequence of 56 bits having alternating 1 and 0 values that are used for synchronization. The start frame delimiter defines a sequence of 8 bits also alternating between 1 and 0 values but ending in a bit configuration of "1 1". The ending "1 1" bits indicate the end of the synchronization bits and the beginning of the medium access control data. The destination address indicates the address of the network device for which the following data is intended. The source address indicates the address of the transmitting device. The type field address indicates the length of the data which follows. The data field includes the physical signal for transmitting the data from the source to the destination. Finally, the frame check sequence is a cyclical redundancy check used for error detection. A transmitting network device performs a specific calculation on the data packet as described in IEEE 802.3. The source transmits the resulting 32 bit value as the last portion of a packet. The destination device then receives the packet and calculates the frame check sequence also in accordance with the IEEE 802.3 standard. Where the calculated value does not match the received value, the destination device assumes that a transmission error has occurred.

Detailed Description Text (23):
FIG. 6 illustrates one embodiment of a flowchart for the negotiation and error detection functionalities. The operation begins at start block 200. Here, a network device is powered up and first connected to a network. The network device then begins negotiating with other network devices at block 210. The devices select the best protocol having the highest transmission rate. After selecting a protocol, the device moves to block 220 where the network devices may interexchange data. While exchanging data, the device detects an error count at block 230. The error count may include a count of the number of errors detected or may include a number representing the error rate or other counts related to the errors resulting from the data transmissions. The error count is then used at a decision block 240 to compare the error count to the threshold. Where the error count is less than the threshold value the device returns to block 220 to exchange more data. Where however, the error count is greater than the threshold level the device proceeds to block 250 where it renegotiates a second protocol. At block 250, the device selects a new protocol which typically has a lower bit-rate and which may be supported over the network link. After renegotiating the protocol, the device then returns to exchange block 220 where it may again exchange data with other network devices.

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L22: Entry 2 of 8 File: USPT Apr 4, 2000

DOCUMENT-IDENTIFIER: US 6046825 A
**** See image for Certificate of Correction ****
TITLE: Facsimile apparatus controlling communication in accordance with registered execution of the error correction mode

Application Filing Date (1):
19960513

Brief Summary Text (5):
Usually, in a facsimile apparatus having an error correction mode (hereinafter referred to as an ECM) as a specific communication function, means for selecting communication having the ECM added thereto (hereinafter referred to as ECM communication) or ECM communication inhibition is provided. The error correction mode is one to correct dropout of data which occurs depending on a communication status, and when an error occurs, a correction process for error data is conducted between transmission and reception.

Brief Summary Text (7):
Usually, in communication at a high transmission speed, a probability of occurrence of communication error is high and dropout of a large amount of image data may occur due to the communication error and the ECM functions effectively for the communication at the high transmission speed. On the other hand, in communication at a low transmission speed, a probability of occurrence of transmission error is low and the ECM is not frequently utilized effectively in the communication at the low transmission speed.

CLAIMS:

2. A facsimile apparatus according to claim 1 further comprising:

detection means for detecting a communication protocol available to a destination station;

wherein said control means selects one of the first communication protocol and the second communication protocol for communication in response to the detection of availability of both of the first communication protocol and the second communication protocol in the destination station by said detection means and the selection to permit the error correction mode by said selection means.

4. A facsimile apparatus having an error communication mode added, comprising:

first registration means for registering information indicating the execution or non-execution of the error correction mode in association with each permitted transmission speed; and

control means for controlling communication based on the information of said first registration means,

wherein said first registration means contains information for permitting the

execution of the error correction mode for the transmission speeds of 14.4 Kb/s and 12 Kb/s and information to inhibit the execution of the error correction mode for the transmission speeds of 9.6 Kb/s, 7.2 Kb/s, 4.8 Kb/s and 2.4 Kb/s.

5. A facsimile apparatus according to claim 4, further comprising:

second registration means for registering information for permitting the execution of the error correction mode for respective permitted transmission speeds and information for inhibiting the execution of the error correction mode for the respective permitted transmission speeds,

said control means controlling communication based on the information of said first registration means and the information of said second registration means.

6. A facsimile apparatus having an error correction mode added, comprising:

first registration means for registering information indicating the execution or non-execution of the error correction mode in association with each permitted transmission speed;

second registration means for registering information indicating the execution or non-execution of the error correction mode in association with each destination station and each transmission speed; and

control means for controlling communication based on one of the information of said first registration means and the information of said second registration means,

wherein said second registration means contains permission information for permitting the execution of the error correction mode for the transmission speeds of 14.4 Kb/s and 12 Kb/s for each destination station and information for inhibiting the execution of the error correction mode for respective permitted transmission speeds of 9.6 Kb/s, 7.2 Kb/s, 4.8 Kb/s and 2.4 Kb/s.

7. A facsimile apparatus according to claim 6, further comprising:

third registration means for registering third information for permitting the execution of the error correction mode for the respective permitted transmission speeds for each destination station and information to inhibit the execution of the error correction mode for the respective permitted transmission speeds,

said control means controlling communication based on the information of said second registration means and the information of said third registration means.

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L22: Entry 3 of 8 File: USPT Apr 20, 1999

DOCUMENT-IDENTIFIER: US 5896561 A
TITLE: Communication network having a dormant polling protocol

Application Filing Date (1):
19961223

Detailed Description Text (121):
As with component 232 of the transmitter, this function may implemented in a serial communication controller. The primary functions of this device are to remove system overhead information that was added for transmission, perform error control analysis, and provide the raw data to the data destination. It may also be used to perform some or all of the timing recovery function, if the serial implementation is selected. Data rate is programmable under software control and may be controlled from controller 251 as represented by control line 266.

Detailed Description Text (159):
(2) Monitoring of 9600-baud transmissions from the base to other remote units. These transmissions can be used as test patterns to determine if-9600 baud transmissions can be received without errors.

Detailed Description Text (231):
Frequency hopping is the switching of transmitted frequencies according to a sequence that is fixed or pseudo-random and that is available to the sending and receiving stations. The combination of frequency hopping with spread spectrum increases the need for some form of error detection or correction. This may be accomplished either by error-correction codes or by repeated transmission of messages.

CLAIMS:

9. In a radio frequency data communication network located within a premises and having a base station and a plurality of roaming transceivers that are battery powered, a method comprising:

dynamically selecting, by the base station, either a first protocol that requires periodic transmissions by the base station to managing communication among the plurality of roaming transceivers, or a second protocol that does not require periodic transmissions by the base station to permit management of communication by the plurality of roaming transceivers; and

dynamically selecting, by the plurality of roaming transceivers, the second protocol after failing to identify periodic transmissions by the base station.

L22: Entry 6 of 8 File: USPT Oct 22, 1991

DOCUMENT-IDENTIFIER: US 5060140 A
**** See image for Certificate of Correction ****
TITLE: Universal programmable data communication connection system

Application Filing Date (1):
19860116

Brief Summary Text (12):
The software architecture of the invention is based on a network of arbitrary complexity connecting a large number of asynchronously scheduled concurrent message processing software modules. Connection "wires" carry queued buffered data "messages." Flow control (blocking, with timeout, of module scheduling on absence of a message, or queue-full error) is available on both the transmitting and receiving ends of each message path. Messages are passed among processing modules using operations contained in a library. This message level switching system is characterized by a repertoire of message operations determined by input or output request type, single or multiple sockets, whether message or event and the wait or proceed control on flow control error (blocking or nonblocking). An additional operation permits the requestor to wait for an arbitrary combination of messages or events. In addition, the receive control information (nonblocking), the transmit status information (non-blocking), the transmit status and receive command (blocking), and the transmit request and receive service (blocking) comprise special message operations required to interact with the supervisory level and system services.

CLAIMS:

1. A data protocol converter for a data communication system, said data protocol converter selectively connecting and allowing data communication between at least one data source having a first communication protocol, said data source coupled to a selected one of a plurality of data communication system input ports, and at least one data destination having a second communication protocol different from said first communication protocol, said data destination coupled to a selected one of a plurality of data communication system output ports, said data protocol converter comprising:

at least one user definable protocol processing process capable of being executed on said data communication system, each user definable protocol processing process including:

at least one logical input to recieve data from said data source, and including a data queue receiving said data;

at least one logical output; and

at least first and second user selectable communication protocol translation tasks selectable from among a plurality of communication protocol translation tasks, each of said first and second communication protocol translation tasks including at least one data input and one data output;

means, responsive to user selections, for selecting said at least first and second protocol translation tasks from among said plurality of protocol translation tasks;

path connecting means, responsive to said user selections, for selectively providing a data path to interconnect and allow data communication between said data source having said first communication protocol and said data destination having said second communication protocol, said data path comprising a plurality of constituent selectively connectable data sub-paths;

said path connecting means providing a first selectively connectable data sub-path between said at least first and second communication protocol translation tasks, for connecting the input of one of said first and second communication protocol translation tasks and the output of the other of said first and second communication protocol translation tasks, between the input of said other of said first and second communication protocol translation tasks and the logical input of said protocol processing process, and between the output of said one of first and second communication protocol translation tasks and the logical output of said protocol processing process;

said path connecting means providing a second selectively connectable data sub-path between the logical input of said protocol processing process and said selected input of said data communication system connected to said data source, wherein the logical input of said protocol processing process is connected to receive data from said data source;

said path connecting means providing a third selectively connectable data sub-path between the logical output of said protocol processing process and said selected output of said data communication system connected to said data source, wherein the logical output of said protocol processing process is connected to provide protocol converted data to said data destination; and

a path control manager, operative to control execution of each protocol processing process, and to maintain a flow of data along said data path from said data source to said data destination along said selectively connectable constituent first, second and third data sub-paths, according to and through the selected communication protocol translation tasks executing in said at least one protocol processing process.

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L22: Entry 7 of 8 File: USPT Jun 4, 1991

DOCUMENT-IDENTIFIER: US 5021890 A
TITLE: Method of and apparatus for facsimile communications

Application Filing Date (1):
19890321

Detailed Description Text (21):
Furthermore, a facsimile apparatus including both a standard transmission control procedure and a special transmission control procedure provided with an error control function can also realize such error-free facsimile communications.

CLAIMS:

5. A facsimile apparatus for use with a communication network having changeable transmission conditions, comprising:

means for communicating with the network using a first communications protocol, the first protocol being a standard protocol for communicating by facsimile and conforming to standards established by CCITT;

means for communicating with the network using a second communications protocol, the second protocol being a special transmission control protocol with an adaptive error control function which is responsive to the transmission conditions; and

means for selecting either the first or the second protocol.

7. A method of facsimile communication between first and second facsimile apparatus via a network having a portion with good transmission quality and a portion with bad transmission quality disposed between the facsimile apparatuses, each facsimile apparatus including means for communicating using a first communications protocol and means for communicating using a second communications protocol, the first protocol being a standard protocol for communicating by facsimile and conforming to standards established by CCITT, and the second protocol being a special transmission control protocol with an adaptive error control function for promoting error correction in response to the quality of the network, said method comprising the steps of:

(a) at the first facsimile apparatus, detecting a facsimile signal emitted by the second facsimile apparatus;

(b) judging the quality of the network based on the signal emitted by the second facsimile apparatus;

(c) selecting either the first protocol or the second protocol based on the judgment conducted in step (b); and

(d) sending a signal with the protocol selected in step (c) from the first facsimile apparatus to the second facsimile apparatus.